REMARKS

5　1. Applicant submits herewith a replacement Abstract in response to the objection set forth in Section 4 of the Office Action. Additionally, Applicant has corrected the single typographical error, as required in Item 5 of the Office Action. For this purpose, Applicant notes that the Examiner indicated the error was found on page 73. Because there is no
10　page 73 in the application, Applicant assumes the Examiner meant page 11. The Examiner is authorized to make the needed revision by Examiner's amendment if Applicant is mistaken.

2. Applicant is of the opinion that all formal claim rejections in Item 7, Item 8, Item 9 of the
15　Office Action (Claims 4 and 15-17) are overcome in view of the claim amendments submitted herewith.

3. Regarding Claim 16, the written description objection under Item 9 appears to be related to the unclarity objection under Item 7. In view of this, Applicant has revised Claim
20　16 so that there is a similarity threshold and that formulation variants are accepted, when semantic differences are above the similarity threshold, while they are rejected, when semantic differences are below the similarity threshold.

As to a description supporting this feature, the Examiner is referred to page 37, third
25　paragraph and the paragraph bridging pages 37 and 38, where Applicant has also recited a prior art reference on semantic similarity.

4. Before discussing the rejection of Claims 1-15 and 18-26 pursuant to 35 U.S.C. 103 (obviousness), Applicant summarizes a key feature of the invention, which is based on
30　varying the order of the text components within a sentence, rather than varying the order of the main sentence and the sub-sentence separated from the main sentence by a comma as is done in Bender.

Referring to the second paragraph of Claim 1, Applicant has explicitly defined that the text
35　components are components of a sentence, and that the sentence has exactly one

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predicate as a component. The predicate or verb, *i.e.*, the word in the sentence, which outlines what is done is used for defining what is to be understood under a sentence. In accordance with the invention, each sub-sentence separated by a comma from a further sub-sentence as taught by Bender has to be considered as a sentence having exactly one

5 predicate as a component.

In accordance with the invention, the processor is operative to vary the order of the text components or to find synonyms for the text components and varying the order of the synonyms, or only finding synonyms for a part of the components and using the other

10 components as they are, *i.e.*, without synonyms. Therefore, Claim 1 is clearly related to the example discussed on page 31, where there are the five components of the sentence, where there is a single predicate (is running) as Item 2 in the second paragraph of page 31, and where there are discussed different orders of the five components, which all have associated therewith a different partial information: The sequence "42135" may be

15 considered as the partial information encoded within the sentence in the penultimate paragraph of page 31.

Bender illustrates different steganography concepts. For example, Bender discloses several possibilities for hiding data within a text including a semantic method, in which, for

20 hiding information within the text, a manipulation of the words themselves is used. Two synonyms are considered as a primary value and a secondary value. No order of the synonyms or something like that is considered here. Furthermore, Bender discloses syntactic methods, in which the structure of a text is changed without substantially changing the meaning or the tone of the sentence. In accordance with Bender, this is done

25 when there is a first sentence and a second sentence which are separated by a comma. An information bit can be hidden within the text when the secondary sentence is located in front of the main sentence, or when the secondary sentence is located subsequent to the main sentence.

30 Bender states that only a small number of information bits can be hidden in a text when using this syntactic method.

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Thus, Claim 1 is new in view of Bender because of at least the following features in the claim:

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- Bender does not disclose that the processor for determining a plurality of formulation alternatives varies the order of the <u>text components</u> of a sentence having <u>exactly one predicate.</u>

- Furthermore, Bender does not disclose the second alternative in Claim 1, *i.e.*, that synonyms are ascertained and that, then, the order of the synonyms is varied.
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- Furthermore, Bender also does not disclose the third alternative, in which components and synonyms are used in a mixed way, and the order is varied.

In view of this, Bender only discloses forming synonyms or changing the order of a main
15 sentence and a secondary sentence. However, Bender does not disclose changing the order of components <u>within</u> the main sentence or the secondary sentence. However, it is exactly this feature, which makes Claim 1 new and inventive.

As outlined on page 334 of Bender, Bender is disadvantageous in that one can only include
20 a small amount of data to be hidden in a text when one uses the modification of the order of a secondary sentence and a main sentence separated by a comma.

Regarding the synonym method, Bender states that synonyms may change the semantic meaning of the sentence altogether.
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Additionally, it has been found out that in many cases, the finding and using of synonyms is not acceptable at all. This is due to different meanings of synonyms and, therefore, different semantic contents of a sentence, which might look suspect for someone who is not the addressee of the hidden information. However, it is the very key feature of steganography
30 that data is hidden <u>without</u> raising any suspicion.

Therefore, when one follows Bender in not using synonyms, the only thing which remains from Bender is the changing of the order of a main sentence and a sub-sentence, which

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results in a completely useless system because of the very limited capability of hiding information into a text.

In accordance with the invention, the inventive concept can even be used in cases in which
5   one does not perform a synonym processing, for example in cases of text books addressed to experts skilled in a certain field. Nevertheless, the invention still allows introducing a significant amount of data into a text in a hidden way because all major languages allow many different ways of positioning the components of a sentence having a single predicate without modifying the semantic sense of the sentence to such a degree that suspicion is
10   raised.   ↑

Thus, the invention is useful in situations in which the Bender concept is not usable at all because of the Bender's small information hiding capability.

15   5. Regarding the analyzer for linguistically analyzing, the Examiner recites page 332, right column, first paragraph and page 334, right column, paragraphs 1, 2. and 3. However, as defined in the second paragraph of Claim 1, the text components are components within a single sentence, *i.e.*, a sentence having exactly one predicate.

20   In the first paragraph of the right column of page 332, it is only stated that a syntactic method utilizing punctuation is used or that words themselves can be manipulated. However, it is not disclosed that a sentence is analyzed with respect to its components.

Furthermore, regarding the first paragraph in the right column of page 334, it is only
25   disclosed to analyze a first sentence "before the night is over" and a second sentence "I will have finished." However, this reference is silent on analyzing the first and the second sentences with respect to additional components. In accordance with the invention, the analyzer analyzes the term "is" as the predicate, the term "before the night" as a time adverbial, and the term "over" as a further adverbial. Furthermore, in accordance with the
30   invention, in which a sentence is analyzed, wherein the sentence has exactly one predicate, the sentence "I will have finished" is analyzed to have, as the predicate, the term "will have finished" and as an additional component, the term "I". This is, however, not disclosed by Bender.

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The same is true for the third paragraph on page 334 of Bender, right column.

Regarding the limitation "determining a plurality of formulation alternatives," the Examiner
5   refers to the paragraph bridging the left and right columns of page 334 of Bender. However,
the general notation "changing the diction and structure of text without significantly altering
meaning or tone" does not anticipate the very specific limitation that the order of the text
components is varied. Because the text components are linguistically analyzed text
components within a single sentence having exactly one predicate, the invention as defined
10   in the third paragraph of Claim 1 exactly and specifically states that the order of the text
components within a single sentence, i.e., a sentence having exactly one predicate is
varied. Because Bender only discloses in general terms that "the diction and structure of
text is changed", and because Bender discloses in the first paragraph in the right column
thereof that this "diction and structure of text" is the order of two sentences, it is not correct,
15   when the Examiner states that this disclosure reads on changing the order of text
components within a sentence having a single predicate as a component.

Regarding the "semantic methods" in the second paragraph in the right column of page
334, it is clear that this disclosure has nothing to do with any changing of an order of text
20   components within a sentence having a single predicate as a component.

Regarding the limitation that every formulation alternative is grammatically correct, Bender
does not disclose this feature, because Bender does not disclose that the order of the
components within a sentence has to be changed for hiding information.
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Additionally, the invention has the limitation that every sequence has specific partial
information allocated thereto. However, this feature is not shown in Bender because
Bender does not disclose varying the order of text components within a sentence, wherein
this sentence is defined as a sentence having exactly one predicate (second paragraph of
30   amended Claim1).

Finally, because Bender does not "encode" any information into the order of text
components within a single sentence, Bender can also not disclose that, in accordance with

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the information which is to be hidden into the text, a specific sequence alternative or a specific order of text components is selected.

5 Thus, the invention linguistically analyses an input text and provides several formulation alternatives, which are different from each other at least in the order of the text components within a sentence. Then, in accordance with the information to be hidden, a certain specific sequence, *i.e.*, a certain specific order of text components, which forms a formulation alternative is selected to encode exactly this information into the text, which is to be encoded or hidden into the text.

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Because Bender does not disclose providing different formulation alternatives for text components within a sentence, Bender can also not show this feature. Additionally, the Examiner is mistaken when stating in the third paragraph of page 7 that Bender discloses several different methods individually and refers to "formulations", because, as outlined 15 above, Bender is completely silent on varying the order of components within a single sentence.

Regarding the example in the first paragraph of the right column of page 334, the invention would not work for these very simple sentences, because, as these sentences are 20 understood, no grammatically correct formulation alternatives can be generated. Therefore, this example is excluded from the claim, because the claim requires at least two different formulation alternatives, which have a different order of text components within the sentence, and which has formulation alternatives, which are grammatically correct.

25 Regarding these inventions, the Examiner's attention is also drawn to the example on page 30 regarding the sentence "the car is running fast on slippery road over the hill" with respect to the different formulation alternatives. From this example, it becomes clear that the Bender example is substantially different from the invention and can not render Claim 1 obvious (nor the other independent claims).

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Should the Examiner deem It helpful, he is encouraged to contact Applicant's attorney, Michael A. Glenn at (650) 474-800.

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19

REPLACEMENT PAGE
11

written notes in order to thus enter the modified text into his device for extraction.

The device according to the invention furthermore is robust with respect to slight modifications of the text as such, e.g. when typing errors are correct, simple errors in article are corrected, single/plural tense endings are modified, etc.

Depending on the embodiment of the device and method according to the invention, only the sequence of the text components themselves is varies, and there are no synonyms ascertained in order to hide still more information in the text. As an alternative, it is possible to ascertain for all text components synonyms, and in this case the sequence of the synonyms for the text components will be varied instead of the sequence of the text components. Finally, it is possible as well to ascertain synonyms only for part of the text components of the sentence, in order to then vary the sequence of the text components and of the synonyms ascertained for specific text components, respectively.

As will be elucidated in the following, steganographic methods may be employed even in compressing the secret information, which may be combined with methods of textual steganography ~~stenography~~ : either for obtaining higher robustness with respect to changes or easy recognizability of these changes, or for increasing the amount of information that can be hidden. However, if just the sequence of the text components is used for hiding information, reformulations in the sense of other synonyms of course will not affect the success of the device for extraction. However, the bandwidth, i.e. the amount of information that can be hidden in the text, is decreased considerably thereby. Thus, there is a compromise between robustness of the modified text with respect to changes on the one hand and the possible bandwidth on the other hand, with this compromise being